the pilot plants at WRRC

Industrial Products Pilot Plant

Biobased Products/Biofuels Pilot Plant

Food Processing Pilot Plant

MODERNIZATION OF THE RESEARCH AND DEVELOPMENT FACILITY

STATUS AND NEED

The Research and Development Facility, or Pilot Plant, at the Western Regional Research Center in Albany, California is a 45,000 ft^2 specialized facility that has been home to many productive research projects during the Center's 65 year history. Uses include Time-Temperature Tolerance (T-TT) studies for optimizing conditions for frozen foods, many technologies for food dehydration, food processing innovations to reduce waste and environmental impact, and fer-

mentations to fuels and novel products. Modern day studies include creating healthy fruit and vegetable-based convenience foods using extrusion and other advanced processing technologies; recovery of phytonutrient chemicals from citrus byproducts that can combat cancer; development of edible coatings to preserve fruits and vegetables; improved processing of cereal brans and other cholesterol-lowering foods to increase utilization in the diet; development of biobased products, biofuels and unique biorefinery concepts using agricultural crops and residues; and development of sampling methods for aflatoxin and other toxins in almonds, pistachios, and other products in relation to food safety.

In order to improve the R&D Facility to meet present and future needs, a multi-phase modernization was initiated by ARS in 1997. The modernized facility will be home to research involving 70 or more ARS scientists and scientific support staff, as well as industry CRADA partners and University collaborators. Design of Phases 1-5 was largely completed by 2005. Construction of Phases 1 and 2 was completed in 2004, using funds appropriated by Congress in FY 01 and 02, and are now in active use. No additional construction funds were appropriated in FY 03, 04, and 05, and no additional construction funds are expected to be appropriated in FY 06, so that modernization of roughly 70% of the Facility is yet to occur. Construction funds for Phase 3, which houses the fruit and vegetable processing research, and all remaining phases are urgently needed.

Remaining needs:
Phase 3: $4.0 Million...Phase 4: $7.6 Million....Phase 5: $4.6 Million and Phase 6: $3.5 Million.
Phase 6 addresses fire safety and other code related issues not included in phase 1-5 design

Resources:
Specifically defined areas are available for safe and confidential processing of agricultural crops and marine products leading to edible food products and non-food biobased products and fuels. The space is flexible allowing use of modular equipment as well as the assembly of coordinated process sequences. The pilot labs are equipped with process equipment representing most important unit operations needed for foods and crop conversion and separation.

Partnerships:
We are eager to explore new partnerships that would make use of the WRRC Pilot Plants in such areas as development of new biobased products, biofuels and bioenergy from agricultural products/byproducts; new healthy food forms utilizing fruits, vegetables, and cereal grains; and water and energy-efficient new methods for food processing and preservation.

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Illustrations:

Front:
(Left to right) Historical black and white photos illustrate a cabinet drier, the high-bay area of the industrial pilot plant, a hot air grain popper with William Rockwell, a tunnel drier used in experimental studies and for supporting WWII dehydration schools, and early construction of the space. The three primary pilot laboratories occupy most of the north wing of the Center as shown in the color fold out.
Back:
A recent 360° and a west facing view of the Food Processing Pilot Plant.

WRRC RESEARCH AND DEVELOPMENT FACILITY

Process Equipment Supported Capabilities (Food and Industrial):

Ambient and Heated Mixing
Atmospheric and Vaccuum Canning
Batch and Continuous Centrifugation
Blanching
Coating
Comminuting
Compression molding
Culinary Steam
Cutting
Emulsifying
Extrusion (single and double screw)
Fermentation
Filtration: (physical, ultrafiltration, reverse osmosis)
Freeze Drying
Freezing
Heat Transfer
Homogenizing / Emulsification
Milling
Pasteurizing
Peeling
Plastics molding and extrusion
Puffing
Reverse Osmosis
Screen Separation
Size Reduction
Solvent Extraction
Solvent Processing space.
Spray Drying
Spray Drying
Ultra Filtration
Ultrasonic Treatment
Vacuum Evaporation

Solvent Processing Space

Full Range of Materials Testing Instrumentation

Working space physical overhead varies from one to four stories.
Research bays may be compartmentalized for confidentiality.